

**WHAT IS CLAIMED IS:**

1. A method of treating hemorrhagic shock in a patient, comprising:  
administering to a patient diagnosed as suffering from hemorrhagic shock an amount  
of a pharmaceutical composition comprising carbon monoxide effective to reduce tissue  
5 damage resulting from the hemorrhagic shock.

2. The method of claim 1, further comprising administering to the patient at least one  
treatment selected from the group consisting of: blood transfusion, rehydration, surgery,  
antibiotic therapy, and vasoactive drug therapy.

3. The method of claim 1, wherein the pharmaceutical composition is in gaseous  
form and is administered to the patient via inhalation.

4. The method of claim 1, wherein the pharmaceutical composition in is gaseous  
15 form and is administered topically to an organ of the patient other than the lung.

5. The method of claim 1, wherein the pharmaceutical composition in is gaseous  
form and is administered to the abdominal cavity of the patient.

6. The method of claim 1, wherein the pharmaceutical composition is in liquid form  
20 and is administered to the patient orally.


7. The method of claim 1, wherein the pharmaceutical composition is in liquid form  
and is administered topically to an organ of the patient.

8. The method of claim 1, wherein the pharmaceutical composition is in liquid form  
and is administered to the abdominal cavity of the patient.

9. The method of claim 1, wherein the pharmaceutical composition is in liquid form  
30 and is administered to the patient intravenously or intraperitoneally.

10. The method of claim 1, further comprising observing a reduced level of systemic tissue damage than would have occurred in the absence of effective treatment.

11. The method of claim 1, further comprising monitoring the patient for signs of hemorrhagic shock.

12. A method of treating hemorrhagic shock in a patient, comprising:   
administering to a patient diagnosed as at risk for hemorrhagic shock an amount of a pharmaceutical composition comprising carbon monoxide effective to reduce systemic tissue damage resulting from the hemorrhagic shock; and  
monitoring the patient for signs of hemorrhagic shock.

13. The method of claim 12, further comprising administering to the patient at least one treatment selected from the group consisting of: blood transfusion, rehydration, surgery, antibiotic therapy, and vasoactive drug therapy.

14. The method of claim 12, wherein the pharmaceutical composition is in gaseous form and is administered to the patient via inhalation.

15. The method of claim 12, wherein the pharmaceutical composition is in gaseous form and is administered topically to an organ of the patient other than the lung.


16. The method of claim 12, wherein the pharmaceutical composition is in gaseous form and is administered to the abdominal cavity of the patient.

17. The method of claim 12, wherein the pharmaceutical composition is in liquid form and is administered to the patient orally.

18. The method of claim 12, wherein the pharmaceutical composition is in liquid form and is administered topically to an organ of the patient.

19. The method of claim 12, wherein the pharmaceutical composition is in liquid form and is administered to the abdominal cavity of the patient.

20. The method of claim 12, wherein the pharmaceutical composition is in liquid form and is administered to the patient intravenously or intraperitoneally.

21. A method of treating hemorrhagic shock in a patient, comprising:   
 (a) identifying a patient suffering from, or at risk for, hemorrhagic shock;  
 (b) administering fluid resuscitation to the patient; and  
 (c) simultaneously with or following step (b), administering to the patient a pharmaceutical composition comprising carbon monoxide in an amount effective to reduce systemic tissue damage resulting from the hemorrhagic shock.

22. The method of claim 21, wherein administering fluid resuscitation comprises administering a liquid carbon monoxide composition to the patient.

23. The method of claim 21, wherein the liquid carbon monoxide composition is carbon monoxide-saturated Ringer's Solution.

24. The method of claim 21, wherein administering fluid resuscitation comprises administering to the patient blood that is partially or completely saturated with carbon monoxide.

25. The method of claim 21, wherein administering fluid resuscitation further comprises administering carbon monoxide-saturated Ringer's Solution to the patient.

26. The method of claim 21, wherein the pharmaceutical composition is in gaseous form and is administered to the patient via inhalation.

27. The method of claim 21, wherein the pharmaceutical composition is in gaseous form and is administered topically to an organ of the patient other than the lung.

28. The method of claim 21, wherein the pharmaceutical composition is in gaseous form and is administered to the abdominal cavity of the patient.

5           29. The method of claim 21, wherein the pharmaceutical composition is in liquid form and is administered to the patient orally.

30. The method of claim 21, wherein the pharmaceutical composition is in liquid form and is administered topically to an organ of the patient.

10           31. The method of claim 21, wherein the pharmaceutical composition is in liquid form and is administered to the abdominal cavity of the patient.

32. A method of treating hemorrhagic shock in a patient, comprising: ✓  
15           administering, to a patient diagnosed as suffering from blood loss possibly sufficient to cause hemorrhagic shock, whole blood, or a blood component, containing an amount of dissolved carbon monoxide effective to reduce systemic tissue damage resulting from the hemorrhagic shock.

20           33. The method of claim 32, wherein the patient is undergoing or has undergone surgery.

34. A method of performing a transfusion in a patient, comprising: ✓  
(a) providing whole blood or a blood component suitable for transfusion into a  
25           patient;  
(b) saturating the whole blood or blood component partially or completely with carbon monoxide; and  
(c) infusing the partially or completely saturated whole blood or blood component into the patient, to thereby perform a transfusion in a patient.

35. The method of claim 34, wherein the patient is diagnosed as suffering from or at risk for hemorrhagic shock.

36. A method of treating hemorrhagic shock in a patient, comprising: ✓

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(a) identifying a patient suffering from or at risk for hemorrhagic shock;

(b) providing a vessel containing a pressurized gas comprising carbon monoxide gas;

(c) releasing the pressurized gas from the vessel, to form an atmosphere comprising carbon monoxide gas; and

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(d) exposing the patient to the atmosphere, wherein the amount of carbon monoxide in the atmosphere is sufficient to reduce systemic tissue damage resulting from the hemorrhagic shock.

37. The method of claim 36, wherein the patient is exposed to the atmosphere continuously for at least one hour.

38. The method of claim 36, wherein the patient is exposed to the atmosphere continuously for at least six hours.

39. The method of claim 36, wherein the patient is exposed to the atmosphere continuously for at least 24 hours.

40. The method of claim 36, further comprising monitoring a symptom of hemorrhagic shock in the patient.

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41. A vessel comprising medical grade compressed carbon monoxide gas, the vessel bearing a label indicating that the gas can be used to reduce deleterious sequelae of hemorrhagic shock in a patient. ✓

42. The vessel of claim 41, wherein the deleterious sequelae comprise systemic inflammation.

43. The vessel of claim 41, wherein the deleterious sequelae comprise systemic tissue injury.

44. The vessel of claim 41, wherein the carbon monoxide gas is in admixture with an oxygen-containing gas.

45. The vessel of claim 44, wherein the carbon monoxide gas is present in the admixture at a concentration of at least about 0.025%.

46. The vessel of claim 44, wherein the carbon monoxide gas is present in the admixture at a concentration of at least about 0.05%.

47. The vessel of claim 44, wherein the carbon monoxide gas is present in the admixture at a concentration of at least about 0.10%.

48. The vessel of claim 44, wherein the carbon monoxide gas is present in the admixture at a concentration of at least about 1.0%.

49. The vessel of claim 44, wherein the carbon monoxide gas is present in the admixture at a concentration of at least about 2.0%.

50. A vessel comprising whole blood, or a blood component, that is partially or completely saturated with carbon monoxide, the vessel bearing a label indicating that the whole blood or blood component can be administered to a patient to reduce deleterious sequelae of hemorrhagic shock.

51. A business method comprising:

- (a) providing whole blood or a blood component suitable for transfusion into a patient;
- (b) treating the blood or blood component with carbon monoxide to produce a blood/carbon monoxide product; and

(c) supplying the blood/carbon monoxide product to a customer with instructions to administer the blood/carbon monoxide product to a patient in need of a transfusion.

52. The business method of claim 51, wherein (b) comprises exposing the blood to an atmosphere comprising carbon monoxide.

53. The business method of claim 51, wherein the customer is a hospital or caregiver.

5 54. The business method of claim 51, wherein the instructions include instructions to administer the blood/carbon monoxide product to a patient who has suffered significant blood loss.